

NATURAL RESOURCES CONSERVATION SERVICE

VIRGINIA CONSERVATION PRACTICE STANDARD

HERBACEOUS WIND BARRIERS

(Feet)

CODE 603

DEFINITION

Herbaceous vegetation established in rows or narrow strips across the prevailing wind direction.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following:

- Reduce soil erosion from wind
- Protect growing crops from damage by wind-borne soil particles
- Provide food and cover for wildlife

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland, or other land where crops are grown.

This standard includes the location of herbaceous wind barriers and their management for identified uses. Criteria for the establishment of annual and perennial herbaceous vegetation are in practices standards for establishing permanent vegetation and in the *Plant Establishment Guide for Virginia*.

CRITERIA

GENERAL CRITERIA APPLICABLE TO ALL PURPOSES NAMED ABOVE

A. Vegetation

Barriers may consist of perennial or annual plants, growing or dead. Plant materials shall be selected for the following characteristics:

- Adaptation to the site
- Erect non-spreading growth habit
- Resistant to lodging
- Good leaf retention
- Minimum competition with adjacent crops

B. Number of Rows

Barriers may consist of one row of plants, providing that the required porosity can be achieved with a single row, and that the row contains no gaps. More than one row shall be planned for each barrier on sites such as sandy soils, that negatively affect the establishment or survival of the barrier.

Where two or more rows are required to achieve the required porosity and to avoid gaps, the rows shall be spaced no more than 36 inches apart.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

C. Barrier Direction and Spacing

The effective spacing between barriers shall be determined using current approved wind erosion prediction technology. When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced. See Table 502-3 of the National Agronomy Manual for adjustment factors.

D. Calculating Porosity

The number of rows of vegetation needed to achieve the required porosity listed in this standard shall be determined using the most current wind erosion technology.

E. Harvest

Harvest of hay or seed from perennial barriers, grazing, or mowing for weed control, shall be managed to allow regrowth to the planned height before periods when wind erosion or crop damage are expected to occur. Annual barriers will be managed so barriers are sufficient height and condition to meet their intended purpose.

ADDITIONAL CRITERIA TO REDUCE SOIL EROSION FROM WIND

A. Barrier Height

Barriers designed for this purpose shall have a minimum expected height of 1.5 feet during the wind erosion period for which the barriers are designed.

B. Barrier Porosity

Barriers established for this purpose shall be designed to achieve a porosity of 40-50 percent.

C. Barrier Direction and Spacing

When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced.

The spacing between barriers shall be measured along the prevailing wind erosion direction during those periods when wind erosion is expected to occur. Spacing shall not exceed 10 times the expected height of the barrier plus additional width permitted by the soil loss tolerance (T), or other planned soil loss objective.

The effective spacing between barriers shall be determined using current approved wind erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system.

ADDITIONAL CRITERIA TO PROTECT GROWING CROPS FROM DAMAGE FROM WIND-BORNE SOIL PARTICLES

A. Barrier Height

Barriers designed for this purpose shall have a minimum expected height of 0.5 feet during those periods when growing crops are susceptible to damage by blowing wind or wind-borne soil particles. The designed height of the barrier will depend on the distance between the barrier and the crop being protected, and the crop height at which it will no longer need the protection of the barrier.

B. Barrier Porosity

Barriers established for this purpose shall be designed to achieve a porosity of 40-50 percent during the period when growing crops are to be protected.

C. Barrier Direction and Spacing

When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced.

The spacing between barriers shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles. Spacing shall not exceed 10 times the expected height of the barrier plus additional width permitted by the crop tolerance to wind erosion as specified in the NRCS, Field Office Technical

Guide or other technical references, or other planned crop protection objective.¹

Calculations shall account for the effects of other practices in the conservation management system.

ADDITIONAL CRITERIA TO PROVIDE FOOD AND COVER FOR WILDLIFE

A. Vegetation

Barriers established for this purpose shall consist of plants that provide food and cover for the targeted wildlife species. Select barrier species that are adapted to the site and then meet the intended needs of the targeted wildlife species.

B. Barrier Width

Barriers established for this purpose shall have a minimum width of two feet.

C. Barrier Height

Barriers established for this purpose shall have a minimum expected height that provides adequate cover for the targeted wildlife species.

Visual effects of wind erosion should be present if this practice is planned. Some common visual effects are:

1. Dunes (1" – 2" in height)
2. Soil erosion by wind deposited around plants
3. Deposits of uniform size soil particles in depressions and along thick plant barriers

The minimum width of the cropped strip will be 15'. The maximum width will be 10 times the height of the plant species used in the barrier, at the critical wind erosion period.

¹ Crop tolerance to wind erosion is the maximum rate of soil blowing that crop plants can tolerate without significant damage due to abrasion, burial, or desiccation.

CONSIDERATIONS

Transport of wind-borne sediment and sediment-borne contaminants offsite are reduced by this practice when used in a conservation management system.

Herbaceous wind barriers are more suitable than field windbreaks for use under center pivot irrigation systems due to height considerations. Windbreaks may be located outside the windward edge of the circle.

Spacing between barriers may be adjusted, within the limits of the criteria above, to accommodate widths of farm equipment to minimize partial or incomplete passes.

Selection of plants for use in barriers should favor species or varieties tolerant to herbicides used on adjacent crops.

Plants which may be alternate hosts for pests injurious to adjacent crops should not be selected for use in barriers.

Consider plants that serve as host to beneficial, pest-eating insects, pollinators and pest predators. Consider planning barriers as trap strips to attract undesirable insects such as virus- spreading aphids.

Selection of plant species less palatable to animals may reduce damage to barriers from grazing wildlife.

When barriers are designed to enhance wildlife habitat, plant species diversity should be encouraged. The use of evergreens in barriers designed to provide winter cover may increase their value. Barriers that result in multiple structural levels of vegetation within the barrier will maximize wildlife use.

If the barrier is also designed to provide escape or nesting cover for wildlife, locate barriers where they connect areas of existing perennial vegetation whenever possible and include plants that will have a minimum expected height that provides adequate cover for the targeted species. Barriers that connect areas such as woody draws often provide additional escape and travel cover. Two or more rows are often more effective than one row, with a minimum width of two feet between rows. Stiff stems are important in providing cover during severe winter storms.

Some plants are damaged by blowing wind as well as by wind-borne soil particles. In such cases, the spacing between wind barriers may have to be reduced from that obtained using wind erosion prediction technology.

Additional practice information can be found on the Practice Job Sheet for the Virginia Conservation Practice Standard *Herbaceous Wind Barriers* (Code 603.).

PLANS AND SPECIFICATIONS

Specifications for this practice, establishment, and maintenance shall be in accordance with the stated criteria and recorded in the conservation plan case file. Plans and specifications are to be prepared for specific field sites based on this standard.

A herbaceous wind barrier planting plan or job sheet will be developed for all cropland fields on each tract. The management of the barriers will be documented in the conservation plan.

The planting plan or job sheet shall include:

1. A map showing the tract boundaries, field boundaries, and field numbers.
2. The species and date the vegetation is to be planted.
3. The number of barriers to be installed and the spacing between the barriers.
4. The appropriate soil loss calculations to document the before and after wind erosion soil loss.

The following species are recommended but not at the exclusion of other desirable species as determined locally.

ANNUAL SPECIES

Cereal Rye

PERENNIAL SPECIES

Benefits:

Nutrient uptake
Chemical breakdown

Switchgrass

Atlantic Coastal Panicgrass

The procedures for establishing the species selected can be found in the *Plant Establishment Guide for Virginia*.

Following the completion of this conservation practice, the information listed below will be verified (checkout notes). The checkout notes will be maintained as part of the conservation plan case file.

1. Field location: Tract number and field number.
2. Acres in the field.
3. The species planted and the date planted.
4. The number of barriers installed in each field and the spacing between the barriers.

OPERATION AND MAINTENANCE

Annual barriers shall be reestablished each year by planting at recommended dates, leaving rows standing after crop harvest, or leaving standing strips when incorporating a cover crop into the soil.

Gaps in perennial barriers shall be replanted as soon as practical to maintain barrier effectiveness.

After establishment, perennial barriers shall be fertilized at the same time and rate as adjacent field crops, or as needed by the barriers. Weeds shall be controlled with cultivation, mowing, chemicals, or other acceptable methods.

Harvest of hay or seed from perennial barriers, grazing, or mowing for weed control, shall be managed to allow regrowth to the planned height before periods when wind erosion, crop damage, or drifting snow are expected to occur. Annual barriers may be grazed or harvested after critical periods have passed.

Wind-borne sediment accumulated in barriers shall be removed and distributed over the surface of the field as determined appropriate.

Barriers shall be re-established or relocated as needed.

Barriers designed to enhance wildlife habitat should not be mowed or pruned unless their height or width exceeds that required to achieve

the wildlife objective, and they become competitive with the adjoining land use.

Prescribed burning to enhance plant vigor may be completed after nesting/resting periods.

REFERENCES

1. *Plant Establishment Guide for Virginia*.
2. "Warm Season Grasses for Virginia and North Carolina" (Virginia Dept. of Game and Inland Fisheries).
3. 100 Native Forage Grasses in 11 Southern States (USDA-SCS-Ag. *Handbook No. 389*).

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Approved Practice Narrative

(Feet)

CODE 603

603 D1 Herbaceous Wind Barrier: A row, or series of rows, of herbaceous vegetation will be planted across the prevailing wind direction to block the erosive force of the wind. The number of rows

or narrow strips, barrier height, barrier direction and spacing, and the plant species to be used will be provided.

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